We claim:

1. An apparatus comprising:
- a control-voltage based cardiac stimulator;
- a cardiac electrical waveform recorder that is responsive, at least in part, to the control-voltage based cardiac stimulator.

2. The apparatus of claim 1 and further comprising a control-current based cardiac stimulator, wherein the cardiac electrical waveform recorder is also responsive, at least in part, to the control-current based cardiac stimulator.

3. The apparatus of claim 1 and further comprising a cardiac stimulation pulse precursor signal generator that is responsive to the control-voltage cardiac stimulator and having a cardiac stimulation pulse precursor signal output that is operably coupled to the cardiac electrical waveform recorder.

4. The apparatus of claim 3 wherein the cardiac electrical waveform recorder comprises a processor that comprises at least one of:

- at least one analogue signal processing element; and
- at least one digital signal processing element;

wherein the processor is operably responsive to the cardiac stimulation pulse precursor signal output.

5. The apparatus of claim 1 and further comprising a master clock and wherein the control-voltage based cardiac stimulator and the cardiac electrical waveform recorder are both responsive to the master clock.

6. The apparatus of claim 1 and further comprising control means for shielding the cardiac electrical waveform recorder from control-voltage based cardiac stimulator pulses.

7. The apparatus of claim 6 wherein the control means facilitates at least one of the display and storage of cardiac electrical waveforms, during at least an initial 100 millisecond period following a cardiac stimulation pulse, wherein the cardiac electrical waveform is substantially free of distortion and artifacts due to the cardiac stimulation pulse.

8. The apparatus of claim 6 wherein the control means temporarily reduces impedance across electrodes of a cardiac stimulator subsequent to provision of a cardiac stimulator pulse being provided by the cardiac stimulator.

9. The apparatus of claim 6 wherein the control-voltage based cardiac stimulator has an output that provides a biphasic cardiac stimulation pulse.

10. The apparatus of claim 9 wherein the biphasic cardiac stimulation pulse has an initial portion that is characterized by a positive waveform.

11. The apparatus of claim 10 wherein the biphasic cardiac stimulation pulse has a trailing portion that is characterized by a negative waveform.

12. The apparatus of claim 11 wherein the trailing portion has a duration that corresponds, at least in part, to a comparison between a present value of the negative waveform and a previously stored value.

13. The apparatus of claim 12 wherein the previously stored value corresponds, at least in part, to a voltage across electrodes of a cardiac stimulator prior to provision of the cardiac stimulator pulse.

14. An apparatus comprising:
- a cardiac stimulator;
- a cardiac electrical waveform recorder comprising at least a first controllable cardiac electrical waveform path;
- a controller that is operably responsive to the cardiac stimulator and having a control signal output operably coupled to the first controllable cardiac electrical waveform path such that the controller can modify the first controllable cardiac electrical waveform path as a function, at least in part, of the cardiac stimulator.

15. The apparatus of claim 14 wherein the cardiac stimulator comprises at least one of:
- a control-voltage based cardiac stimulator; and
- a control-current based cardiac stimulator.

16. The apparatus of claim 14 wherein the first controllable cardiac electrical waveform path comprises at least one of:
- a sample and hold circuit;
- a cardiac electrical waveform amplifier; and
- an analog to digital converter.

17. The apparatus of claim 14 wherein the cardiac stimulator provides a biphasic cardiac stimulation pulse.

18. The apparatus of claim 14 wherein the cardiac stimulator comprises a cardiac stimulation pulse precursor signal output and wherein the controller is operably responsive to the cardiac stimulation pulse precursor signal output.

19. The apparatus of claim 14 and further comprising a master clock and wherein the cardiac stimulator and the cardiac electrical waveform recorder both use the master clock as a primary clock source.

20. The apparatus of claim 19 wherein the controller also uses the master clock as a primary clock source.

21. A method comprising:
- monitoring a cardiac electrical waveform response;
- determining that a cardiac stimulation pulse is to be administered;
- automatically adjusting the monitoring of the cardiac electrical waveform response prior to administration of the cardiac stimulation pulse;
- administering the cardiac stimulation pulse;
- automatically adjusting the monitoring of the cardiac electrical waveform response subsequent to administration of the cardiac stimulation pulse.

22. The method of claim 21 wherein determining that a cardiac stimulation pulse is to be administered comprises providing at least a first precursor signal at least a predetermined period of time prior to administering a corresponding cardiac stimulation pulse.

23. The method of claim 21 wherein automatically adjusting the monitoring of the cardiac electrical waveform response prior to administration of the cardiac stimulation pulse comprises modifying the monitoring of the cardiac electrical waveform response to thereby diminish detection of the cardiac stimulation pulse when administered.

24. The method of claim 23 wherein modifying the monitoring of the cardiac electrical waveform response to thereby diminish detection of the cardiac stimulation pulse when administered comprises substantially halting conversion of analog information into a digital representation thereof.

25. The method of claim 24 wherein substantially halting conversion of analog information into a digital representation thereof comprises substantially halting conversion of analog information that corresponds to sensed cardiac activity into a digital representation thereof.

26. The method of claim 23 wherein modifying the monitoring of the cardiac electrical waveform response to thereby diminish detection of the cardiac stimulation pulse when administered comprises temporarily substantially de-coupling a value that corresponds to a sensed value of a sensed cardiac electrical response from the sensed cardiac electrical response.

27. The method of claim 26 wherein comprises temporarily substantially de-coupling a value that corresponds to a sensed value of a sensed cardiac electrical response from the sensed cardiac electrical response comprises substantially maintaining the sensed value at a present value regardless of subsequent variations to the cardiac electrical response that occur within some period of time subsequent to maintaining the sensed value at the present value.

28. The method of claim 27 wherein the some period of time comprises a predetermined period of time.

29. The method of claim 27 wherein the some period of time comprises a dynamically determined period of time.

30. The method of claim 23 wherein modifying the monitoring of the cardiac electrical waveform response to thereby diminish detection of the cardiac stimulation pulse when administered comprises storing a present value as corresponds to measured phenomena regarding the cardiac electrical waveform response.

31. The method of claim 30 wherein storing a present value as corresponds to measured phenomena regarding the cardiac electrical waveform response comprises storing a present value as corresponds to measured phenomena regarding the cardiac electrical waveform response as measured across electrocardiogram electrodes.

32. The method of claim 31 wherein storing a present value as corresponds to measured phenomena regarding the cardiac electrical waveform response as measured across electrocardiogram electrodes comprises storing a value that corresponds to a present voltage across the electrocardiogram electrodes.

33. The method of claim 23 wherein modifying the monitoring of the cardiac electrical waveform response to thereby diminish detection of the cardiac stimulation pulse when administered comprises altering gain as pertains to a cardiac electrical waveform response signal path.

34. The method of claim 33 wherein altering gain as pertains to a cardiac electrical waveform response signal path comprises reducing the gain.

35. The method of claim 21 wherein administering the cardiac stimulation pulse comprises administering a biphasic cardiac stimulation pulse.

36. The method of claim 21 wherein administering the cardiac stimulation pulse comprises administering a cardiac stimulation pulse having an initial portion comprised of a waveform having a first polarity.

37. The method of claim 36 wherein administering a cardiac stimulation pulse having an initial portion comprised of a waveform having a first polarity comprises administering a cardiac stimulation pulse having an initial portion comprised of a waveform having a positive polarity.

38. The method of claim 36 wherein administering a cardiac stimulation pulse having an initial portion comprised of a waveform having a first polarity further comprises administering a cardiac stimulation pulse having a portion subsequent to the initial portion comprised of a waveform having a second polarity that is opposite to the first polarity.

39. The method of claim 38 wherein the first polarity comprises a positive polarity and the second polarity comprises a negative polarity.

40. The method of claim 38 wherein administering a cardiac stimulation pulse having a portion subsequent to the initial portion comprised of a waveform having a second polarity that is opposite to the first polarity comprises administering a cardiac stimulation pulse having a portion subsequent to the initial portion comprised of a waveform having at least a portion thereof comprising a trailing edge ramp waveform.

41. The method of claim 38 wherein administering a cardiac stimulation pulse having a portion subsequent to the initial portion comprised of a waveform having a second polarity that is opposite to the first polarity further comprises:
- determining when the portion subsequent to the initial portion has a value that corresponds in a predetermined way with respect to another parameter;
- automatically concluding the cardiac stimulation pulse as a function, at least in part, of determining that the portion subsequent to the initial portion has a value that corresponds in the predetermined way with respect to the another parameter.

42. The method of claim 41 wherein determining when the portion subsequent to the initial portion has a value that corresponds in a predetermined way with respect to another parameter comprises determining when the portion subsequent to the initial portion has an amplitude that corresponds in a predetermined way with respect to another parameter.

43. The method of claim 41 wherein determining when the portion subsequent to the initial portion has a value that corresponds in a predetermined way with respect to another parameter comprises determining when the portion subsequent to the initial portion has a value that corresponds in a predetermined way with respect to a previous value that corresponds to a previously monitored cardiac electrical waveform response.

44. The method of claim 43 wherein determining when the portion subsequent to the initial portion has a value that corresponds in a predetermined way with respect to a previous value that corresponds to a previously monitored cardiac electrical waveform response comprises determining when the portion subsequent to the initial portion has a value that corresponds in a predetermined way with respect to a previous value that corresponds to a previously monitored voltage value across electrocardiogram electrodes.

45. The method of claim 41 wherein determining when the portion subsequent to the initial portion has a value that corresponds in a predetermined way with respect to another parameter comprises determining when the portion subsequent to the initial portion has a value that substantially equals another parameter.

46. The method of claim 21 wherein automatically adjusting the monitoring of the cardiac electrical waveform response subsequent to administration of the cardiac stimulation pulse comprises automatically adjusting the monitoring of the cardiac electrical waveform response subsequent to administration of the cardiac stimulation pulse within 20 milliseconds of when the cardiac stimulation pulse concludes.

47. The method of claim 46 wherein automatically adjusting the monitoring of the cardiac electrical waveform response subsequent to administration of the cardiac stimulation pulse within 20 milliseconds of when the cardiac stimulation pulse concludes comprises automatically adjusting the monitoring of the cardiac electrical waveform response subsequent to administration of the cardiac stimulation pulse within 10 milliseconds of when the cardiac stimulation pulse concludes.

48. The method of claim 21 wherein automatically adjusting the monitoring of the cardiac electrical waveform response subsequent to administration of the cardiac stimulation pulse comprises adjusting the monitoring to substantially equate with the monitoring of the cardiac electrical waveform response prior to the automatic adjustment of the monitoring of the cardiac electrical waveform response prior to administration of the cardiac stimulation pulse.

49. The method of claim 21 wherein automatically adjusting the monitoring of the cardiac electrical waveform response prior to administration of the cardiac stimulation pulse comprises using at least one interpolated cardiac electrical waveform response value.

50. The method of claim 21 wherein administering the cardiac stimulation pulse comprises administering a cardiac stimulation pulse that:
- firstly stimulates a tissue using an electrode; and
- secondly administers a pulse sufficient to discharge interface capacitance between the at least one electrode and the tissue.

51. The method of claim 50 wherein administering a pulse sufficient to discharge interface capacitance between the at least one electrode and the tissue continues until the interface capacitance is substantially fully discharged.

52. The method of claim 21 and further comprising displaying information that corresponds to the cardiac electrical waveform response.

53. The method of claim 52 wherein displaying information that corresponds to the cardiac electrical waveform response comprises further displaying information that describes, at least in part, the cardiac stimulation pulse.

54. The method of claim 53 wherein further displaying information that describes, at least in part, the cardiac stimulation pulse comprises generating at least part of the information using previously stored information.

55. The method of claim 52 and further comprising also displaying information that corresponds to the stimulation pulse.

56. The method of claim 55 wherein displaying information that corresponds to the stimulation pulse further comprises displaying a graphic indication of a temporal occurrence of a stimulation pulse with respect to the cardiac electrical waveform response.

57. The method of claim 52 wherein displaying information that corresponds to the stimulation pulse further comprises displaying information regarding a characteristic of the stimulation pulse.

58. The method of claim 57 wherein displaying information regarding a characteristic of the stimulation pulse further comprises displaying information regarding at least one of:

- a pulse width of the stimulation pulse; and
- a pulse amplitude of the stimulation pulse.

59. The method of claim 21 wherein:
- monitoring the cardiac electrical waveform response;
- determining that a cardiac stimulation pulse is to be administered;
- automatically adjusting the monitoring of the cardiac electrical waveform response prior to administration of the cardiac stimulation pulse;
- administering the cardiac stimulation pulse; and
- automatically adjusting the monitoring of the cardiac electrical waveform response subsequent to administration of the cardiac stimulation pulse;
are all done synchronously.

60. The method of claim 59 and further comprising providing a master clock and wherein:
- monitoring the cardiac electrical waveform response;
- determining that a cardiac stimulation pulse is to be administered;
- automatically adjusting the monitoring of the cardiac electrical waveform response prior to administration of the cardiac stimulation pulse;
- administering the cardiac stimulation pulse; and
- automatically adjusting the monitoring of the cardiac electrical waveform response subsequent to administration of the cardiac stimulation pulse;
are all done synchronously as a function, at least in part, of the master clock.

61. The method of claim 21 wherein automatically adjusting the monitoring of the cardiac electrical waveform response prior to administration of the cardiac stimulation pulse comprises automatically adjusting the monitoring of the cardiac electrical waveform response within about 0.1 to 30 milliseconds of administering the cardiac stimulation pulse.

62. An integrated electrophysiology catheter workstation and cardiac stimulator with substantially uninterrupted electrocardiogram recording capability comprising:
- a cardiac stimulator having an output that provides cardiac stimulation pulses;
- a cardiac electrical waveform response monitor responsive to the cardiac stimulation pulses and having at least a first mode of operation and a second mode of operation, wherein:
    - pursuant to the first mode of operation the cardiac electrical waveform response monitor processes cardiac electrical waveform response information using a first process; and
    -pursuant to the second mode of operation the cardiac electrical waveform response monitor processes cardiac electrical waveform response information using a second process, which second process is different from the first process.

63. The integrated electrophysiology catheter workstation and cardiac stimulator of claim 62 wherein the output of the cardiac stimulator provides a biphasic cardiac stimulation pulse.

64. The integrated electrophysiology catheter workstation and cardiac stimulator of claim 63 wherein the output of the cardiac stimulator provides one of a substantially constant current stimulation pulse and a substantially constant voltage stimulation pulse.

65. The integrated electrophysiology catheter workstation and cardiac stimulator of claim 64 wherein the cardiac stimulator includes a stimulation pulse selector and wherein the provision of one of a substantially constant current stimulation pulse and a substantially constant voltage stimulation pulse is responsive to the stimulation pulse selector.

66. The integrated electrophysiology catheter workstation and cardiac stimulator of claim 62 and further comprising an operating mode selector that is operably responsive to an operational state of the cardiac stimulator.

67. The integrated electrophysiology catheter workstation and cardiac stimulator of claim 66 wherein the operating mode selector further comprises operating mode selection means for selecting the first mode of operation during an event window that includes provision of the cardiac stimulation pulse.

68. The integrated electrophysiology catheter workstation and cardiac stimulator of claim 67 wherein the operating mode selection means are further for selecting the second mode of operation during at least some time other than during the event window.

69. The integrated electrophysiology catheter workstation and cardiac stimulator of claim 68 wherein the event window precedes by at least some period of time provision of the cardiac stimulation pulse.

70. The integrated electrophysiology catheter workstation and cardiac stimulator of claim 69 wherein the operating mode selection means initiates the event window in response to detecting a precursor signal that provides an early indicia of imminent provision of the cardiac stimulation pulse for initiating the event window.

71. The integrated electrophysiology catheter workstation and cardiac stimulator of claim 62 wherein the first mode of operation comprises a de-sensed mode of operation for the cardiac electrical waveform response monitor, such that the monitor will be less sensitive to at least one of detection and processing of the cardiac stimulation pulse.